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ABSTRACTS OF TUBERCULOSIS

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Serological Immunity in Tuberculosis.—The slight changes occasioned by intraperitoneal superinfection in tuberculous guinea pigs is attributable to antibodies favoring lymphocytosis, and a phagocytosis and lysis of tubercle bacilli. These lytic antibodies occurring, especially in the serum and in exudates from superinfected animals, are transferable to normal animals. Upon intraperitoneal injection of 1 mgm. of tubercle bacilli, mixed with 1 cc. of serum or exudate from a superinfected animal, into normal guinea pigs, findings occur similar to those seen in a tuberculous animal after intraperitoneal superinfection. In guinea pigs the pleural exudate was especially active when it had been obtained from rabbits after intravenous superinfection. Similar effects were obtained with pseudoglobulin fractions of serum from specifically treated tuberculous cattle or from tuberculous human exudates. The serum of bovine-infected animals was active against human bacilli and *vice versa*. A means of gauging a tuberculous serum was the Pfeiffer experiment. Agglutinins, tropins for tubercle bacilli, and complement-binding substances were almost or entirely lacking in the sera. The allergy produced by the tuberculosis serum or its pseudoglobulin in normal guinea pigs revealed itself, after subcutaneous infection, by an inflammatory reaction at the inoculation site and a retarded ulceration. The animals were also sensitized to the intracutaneous or subcutaneous injection of watery extracts of tubercle bacilli, and less so to Old Tuberclin. In tuberculous guinea pigs the Koch reaction diminished earlier after serum treatment. Treatment with dead tubercle bacilli or their derivatives occasioned only a weak tuberculin hypersensitiveness in guinea pigs and rabbits.—*Über Tuberkuloseserum. Beiträge zum Mechanismus der Immunität bei Tuberkulose, O. Ornstein, Zeitschr. f. Hyg., 1928, cviii, 360.*—(*H. J. C.*)

Immunization of Guinea Pigs with Dead Tubercle Bacilli.—Roemer, Baldwin and Bessau have shown that skin sensitiveness to tuberculin can, in some instances, be induced in animals by the injection of heat-killed tubercle bacilli. These results have not only been confirmed by the authors, but the new fact has been brought out that such hypersensitiveness did not vary, in so far as intensity of the allergy was concerned, from that obtained when animals were infected with living virulent material. Koch's cutaneous, Long's intratesticular and Paterson's intrapleural phenomena have been demonstrated similar in every respect to the reactions in infected animals. In a later work the authors also demonstrated that guinea pigs treated with heat-killed tubercle bacilli possessed some immunity to virulent infection, but now realize that they used too large an infective dose for testing the immunity.

The present paper represents further observations on the relative immunity to a definite number of living virulent organisms of guinea pigs so treated. The material used for sensitization was human tubercle bacillus (H 37) cultivated either on potato or synthetic broth. A few weeks' growth was removed, dried between blotting paper, triturated in a mortar and made into a suspension. After allowing the coarse particles to settle, the supernatant portion was removed, the reaction adjusted to pH 7.2 and the dry weight determined. This suspension was then put into small vials and heated at 100°C. for one-half hour, after which it was ready for use. The route by which the heat-killed tubercle bacilli are introduced into the animal plays a very important rôle in obtaining uniformly positive results. Many routes were tested, including intracardiac injections, feeding, inhalation (sprays), conjunctivae and intranasal instillations, intratesticular and intraperitoneal injections. The last two methods gave the best results, the intratesticular route yielding 100 per cent positive reactions (skin tests) to old tuberculin, within fourteen days (16 pigs), and remaining so for from five to eight months; and the intraperitoneal route, 95 per cent positive reactions in from fourteen to twenty days (75 pigs), and remaining so for at least seven to eight months. *Immunity Experiments:* One hundred and fifty healthy tuberculin-negative (skin test) guinea pigs were selected, weighing from 350 to 600 gm., many of them being of pure white stock. One-half of them received 3 intraperitoneal injections of heat-killed tubercle bacilli at three- to four-day intervals to the total amount of 7.5 mgm. The remaining animals were kept in a separate room and used as controls. Two weeks after the completion of sensitization 65 of the sensitized animals and 66 of the controls remained alive. All animals were tested intracutaneously with 5 per cent old tuberculin. All of the controls were negative to tuberculin and 95 per cent of the sensitized animals reacted positively (criteria for evaluating the skin test are not given). The animals were now divided into three groups, *A*, *B* and *C*, each group consisting of an approximately equal number of sensitized animals (*A1*, *B1*, *C1*) and controls (*A2*, *B2*, *C2*), great care being taken that the animals in each group corresponded as nearly as possible in weight and sex. In selecting the infecting dose, care was taken to avoid too large a dose and to inoculate a definite number of living microörganisms, the virulence of which had previously been determined. A fourteen-day growth of human tubercle bacilli (H 37) cultivated on a synthetic medium was used for inoculation of both the sensitized and the control animals. The growth was removed and a suspension of the microörganisms prepared according to Jennings's methods. The microörganisms were counted and the suspension diluted with saline solution. Injections were made subcutaneously near the groin. Groups A1 and A2 each received 440 microörganisms, B1 and B2 4400 and C1 and C2 44,000 microörganisms. The minimal number of bacilli for a definite infection is estimated to be approximately 25. The findings at autopsy were recorded from o, no gross tuberculosis, through +, ++, etc., to ++++, which represented fulminating generalized tuberculosis. The one-plus group represents those with lesions limited chiefly to the site of inoculation. The results follow: In group A the average duration of life, taking the general mortality, was 369 days for the sensitized animals and 295 days for the controls. However, in the group only 6 of the sensitized animals died of uncomplicated tuberculosis, while there were 14 such deaths among the controls. In the sensitized group the first death from tuberculosis occurred on the two hundred and eleventh day and in the control group on the one hundredth day. In group B (4,400 microörganisms) the average duration of life was 273 days for the sensitized and 236 for the control animals. As intercurrent diseases were more prevalent in this group, there is less difference between the sensitized animals and the controls in survival. Seven of the sensitized animals and all of the controls died of tuberculosis. The earliest death in the sensitized group was on the one hundred and seventy-ninth day and in the controls on the ninety-sixth day. In group C (44,000 microörganisms) the average duration of life was 303 days for the sensitized animals and 168 days for the controls. The duration of life of the sensitized animals was almost 100 per cent longer than that of the controls, and, in addition, the former very definitely showed fewer cases with ++++ tuberculosis. Eleven of the sensitized and 15 of the controls died of tuberculosis. A chart is shown depicting the percentage of deaths (from all causes) up to 250 days and at the end of the experiment (630 days). In the former period the deaths in groups B1, B2 and C1, C2 closely approximate each other, each showing about twice as many as the A group. In the whole period of the experiment the deaths in the control pigs of each group closely approximate 100 per cent, whereas in the sensitized groups A1 shows 54 per cent, B1 75 per cent and C1 95 per cent dead, the greater mortality correlating the higher dosage. There was also a very definite correlation between

the extent of the lesion and the size of the dose. In group A1 there were 9, in group B1 six, and in group C1 two with no macroscopic tuberculosis. At the beginning of the experiment there was no intercurrent disease noted among the animals. However, this difficulty began to manifest itself soon after the test inoculations. It would be ideal if guinea pigs could be bred entirely free from infectious diseases, but this is not practicable in close quarters. It has been customary in the past to make all inoculations subcutaneously. The bacilli are thus localized so that their destruction depends chiefly on the local reactions of the surrounding tissues. No direct studies have been made to determine what normal and acquired protection the fluids of the blood exercise. To investigate this point a series of 20 guinea pigs, ten of whom had been sensitized by heat-killed bacilli as in the preceding experiment, were inoculated intracardially with 500 human tubercle bacilli (H37) approximately twenty days after the last sensitizing dose. The average duration of life was 293 days in the sensitized animals, 6 of these being killed at 348 days. At that time only one of the controls was living, the average length of life in this group being 165 days. Only one of the sensitized animals had a 3-plus involvement, all the rest being one plus or o. There were three of the latter. In the control group, three had 4 plus, four 3 plus, two 2 plus and one 1 plus. None of the controls were free from infection. This intracardiac infection experiment yielded the best results. In all probability the bacilli came more directly in contact with the defensive mechanism present in the sensitized animals. The degree of immunity established by this method of sensitization cannot be regarded as insignificant. The failure of others to obtain an appreciable protection is believed by the authors to be due partly to the large number of infecting microörganisms and partly to the method of infection used in testing the immunity. It is not probable that an absolute immunity against virulent tubercle bacilli can ever be obtained no matter what method is used, either by the use of living virulent, living avirulent or dead microörganisms. So far as the dosage of infection in infants is concerned, excessive doses must be uncommon, hence how unreasonable it is to test the immunity of sensitized animals by inoculating large numbers of infecting microörganisms. The main obstacle in the experiment has been intercurrent disease, and it has not been determined just what influence such disease has on the progress of the tuberculosis. It would seem that when intercurrent disease occurred in the sensitized animals the extent of tuberculosis was found to be minimal. This did not hold for the controls. *Conclusions:* Resistance in tuberculosis is manifested chiefly by a cellular reaction. Former experiments have shown that the cellular reaction obtained in animals sensitized with heat-killed bacilli does not differ from that seen in animals infected with living virulent microorganisms. Therefore, it is believed that immunity produced by dead bacilli is in no way likely to differ from that produced by living bacilli. The authors believe the vaccine of heat-killed tubercle bacilli would be of practical use for the immunization of children against tuberculosis. Heat-killed microörganisms would be harmless as a vaccine for the reason that they cannot grow, whereas attenuated microörganisms, once entering the body, may conceivably revert to their former pathogenicity.—*Immunological Studies in Tuberculosis. V. Resistance of Animals Sensitized with Heat Killed Tubercle Bacilli to a Measured Infecting Dose, S. A. Petroff, A. Branch and F. B. Jennings, Jr., J. Immunol., March, 1929, xvi, 233.*—(*J. S. W.*)

Experiments on Tuberculous Superinfection.—The author repeated the experiments of Toyoda and Young, who claimed that superinfection with tuberculous organ tubercle bacilli cause the development of ulcers, while similar amounts of culture bacilli did not possess this ability. In order to exclude variations of natural resistance, in addition to the experiments of Toyoda and Young, the author tested the superinfection of culture and organ tubercle bacilli on the same animal and in addition culture tubercle bacilli were suspended in tissues as well as organ juice, and thus tested. In all these experiments no appreciable differences were found and it is believed that the previous findings by Toyoda and Young are explicable upon the basis of the individual resistance of the animals.—*Das Verhalten tuberkulöser Meerschweinchen gegenüber einer Superinfektion mit sogenannten tierischen Tuberkelbacillen und mit Kulturbacillen, F. Keller, Zeitschr. f. Hyg., 1928, cviii, 605.*—(*H. J. C.*)

Effect of Temperature and Humidity on Experimental Tuberculosis.—Guinea pigs, kept at about 80°F. and 79 per cent relative humidity, were infected with tubercle bacilli along with similar animals kept at ordinary room temperature. Some were infected by inhalation and some by intraperitoneal inoculation. The experiment was done in an effort to approximate somewhat the shop conditions under which many people must work, especially in the textile

industries. The final results failed to reveal any substantial differences in the type or extent of disease in the two lots, as regards the effect of temperature or humidity upon the disease in general, in males and females, irrespective of the type of inoculation.—*The Effect of High Humidity and Moderately High Temperature on the Susceptibility and Resistance to Tuberculosis in Guinea Pigs, Linda B. Lange and Anna M. Baetjer, Am. J. Hyg., November, 1928, viii, 935.*—(*H.S.W.*)

Haemoptysis in Pulmonary Tuberculosis.—Pulmonary haemoptysis reveals that the bleeding point is in direct communication with the bronchus. Aside from bronchial-wall bleeding, it is clear evidence that softening and ulceration of tuberculous areas, however small, have taken place. This is also true of initial haemoptysis, and is supported by the fact that in a large proportion of such cases tubercle bacilli can be found in the sputum which follows the bleeding. Ruptured small vessels will readily close by natural processes, but, when a large diseased vessel lying in a diseased area has a tear in its wall, the mechanical difficulties are too serious for simple remedies and only pulmonary collapse will influence the course of events.—*The Treatment of Hemoptysis in Pulmonary Tuberculosis, C. Riviere, Tubercle, August, 1928, ix, 509.*—(*W. I. W.*)

Pleural Pain.—Some authorities, influenced largely by the work of Sir James Mackenzie, still hold that the parietal pleura has no pain sense. Recently Parsons has shown, in a dissection, branches of the intercostal nerves going to the parietal pleura. Dogiel demonstrated sensory end-bulbs in the parietal pleura. From clinical experience the author is convinced that the parietal pleura is richly endowed with pain sense. In passing through the chest-wall a needle evokes pain in three structures, the skin, the costal periosteum (if it should be touched), and the parietal pleural. Cutaneous pain is described by the patient as an "ordinary sharp pain," whereas pleural pain is likened to a severe toothache or "neuralgia." The relationship between the severity of the pain and the sharpness of the needle strongly suggests that the chief stimulus necessary to evoke pleural pain is tension or stretching. The origin of the pain is the penetration of the pleura by the needle and is not due to the passage of the needle through the connective tissue overlying the pleura.—*A Note on the Pain Sense of the Parietal Pleura, A. I. G. McLaughlin, Lancet, November 17, 1928, ccxv, 1023.*—(*B. T. McM.*)

Body Temperature in Pulmonary Tuberculosis.—The case sheets of 450 male cases with tubercle bacilli in their sputum and fever (over 99°F.) were studied. It was noted that a temperature persistently above 99°F., especially if accompanied by a pulse-rate of 90 or over, is very unfavorable. In cases with normal temperatures and cases having only one relapse, 34.3 per cent died within two years. In 90.1 per cent of males the difference between the morning and evening temperatures is 1°F. or more. The records of 34 per cent of females diagnosed as tuberculous revealed a definite premenstrual rise of temperature of long duration.—*The Temperature in Pulmonary Tuberculosis, C. Milne, Brit. M. J., December 29, 1928, no. 3547, 1173.*—(*W. I. W.*)

Seasonal Variations in Body Weight.—Studies were made to determine the effect of climate and of the seasons on tuberculous patients. The weight curves revealed a general agreement in all parts of the world. The apparent differences were due to the differences in the climate of the localities where the observations were made. Extremes of heat and cold and dryness of the air cause a fall of weight, while a pleasant temperature, like that of summer in colder countries and the cold season in the tropics, produces a rise in the weight curve. Rains have no particular effect on body weight.—*On Seasonal Variations in Body Weight in Pulmonary Tuberculosis, M. K. Pai, Tubercle, February, 1929, x, 212.*—(*W. I. W.*)

Leucocytes in Pulmonary Tuberculosis.—The results of a study of routine blood counts in 1000 cases of pulmonary tuberculosis are reported. As the counts were done by different technicians, made with no thought of proving anything in particular, it is stated that the findings probably represent a fairly accurate cross-section of typical blood pictures in active pulmonary tuberculosis. In 350 cases only the percentage of monocytes, neutrophiles and lymphocytes were recorded from films stained with Wright's stain, the actual number of cells not being estimated, that is, no total white count was done. In the remainder of the cases the blood counts include total leucocyte counts and numbers and percentages of monocytes, neutrophiles, and lymphocytes. Neither eosinophiles nor basophiles are included in the study, and it is not mentioned whether any allowance was made for these cells in estimating the percentages. With the monocytes were grouped the large and small mononuclears and the transitionals of the Ehrlich classification. In the group in which complete

counts were done, the average monocyte count was 159 per cubic millimetre (2.1 per cent) in the minimal class but reached 516 (4.3 per cent) in the very far advanced class, the increase being $3\frac{1}{4}$ times for the latter group. The average neutrophilic count for the minimal group was 4,161, increasing steadily to an average of 8,880 for the hopelessly ill class, the increase being $2\frac{1}{10}$ times. No percentages are reported for the neutrophiles. The lymphocytes averaged 2,664 (36.3 per cent) in the minimal (I) class, 2,898 (34.5 per cent) in the moderately advanced (II) class, 2,781 (27.2 per cent) in the far advanced (III) class, and 2,460 (20.5 per cent) in the very far advanced (IV) class. Although there was a slight increase in the number of lymphocytes in group II, the average percentage of lymphocytes decreased steadily until the percentage in the far advanced cases was down nearly to one-half the percentage in the minimal cases. The average monocyte-lymphocyte ratio in class I was 1: 16.75; in class II, 1: 15.78; in class III, 1: 8.18; and in class IV, 1: 4.77. The average lymphocyte-neutrophile ratio in class I was 1: 1.53; in class II, 1: 1.75; in class III, 1: 2.50; and in class IV, 1: 3.61. The group (345 cases), in which only the percentages of the cells are reported, gives similar results, although the monocytic percentages are much higher throughout. For this group the monocytes averaged (I) 7.6 per cent; (II) 8.3 per cent; (III) 9.1 per cent; and (IV) 13.7 per cent. The lymphocytes averaged (I) 33.9 per cent; (II) 26.4 per cent; (III) 20.7 per cent; and (IV) 20 per cent; and the neutrophiles, (I) 57.9 per cent; (II) 63.5 per cent; (III) 68.9 per cent; and (IV) 94 per cent. The monocyte-lymphocyte ratio ranged from 1: 1.92 for class I to 1: 1.47 for IV. Charts illustrating the results obtained in repeated counts on several selected cases are given, the favorable cases showing a steady decrease in the monocytes and neutrophiles and an increase in the lymphocytes, and the unfavorable the contrary. *Conclusions: 1:* A full leucocytic picture is a very important part of every examination of a tuberculosis patient. This information is always very helpful in diagnosis, prognosis and treatment, and often gives a truer conception of the pathology of the case than any other part of the examination. *2:* The monocyte-lymphocyte and lymphocyte-neutrophile ratio seem most important and the percentages in the selves seem the next most reliable indication, the numbers per cubic millimetre being least important. *3:* A decreasing monocyte-lymphocyte ratio and an increasing lymphocyte-neutrophile ratio point very definitely to a more active and extensive lesion. The converse points just as definitely to an improved lung condition. *4:* An increase in the percentages of neutrophiles and of monocytes, with a decrease in the percentage of lymphocytes, points quite definitely to a more active and extensive lesion; the converse points to an improved lung condition. Corresponding change in the counts per cubic millimetre of these cells point in corresponding directions, but less definitely. *5:* This study tends to corroborate clinically the experimental work of Cunningham, Sabin, *et al.*, and Medlar and his associates.—*A Study of the Differential Blood Count in One Thousand Cases of Active Pulmonary Tuberculosis, J. W. Flinn, Ann. Int. Med., January, 1929, ii, 62.*—*(J. S. W.)*

Leucocytes in Tuberculosis.—In 92 cases of pulmonary tuberculosis of all stages, as a whole there were normal leucocyte figures or a leucopoenia, and rarely a mild leucocytosis, especially in cavity cases with severe symptoms. The differential count gave, as a rule, a polynucleosis. This polynucleosis was almost always associated with a more or less marked shift to the left. In no case was there a correlation between the blood picture and the pathologico-anatomical character of the disease. The changes in the blood picture are solely the expression of intoxication and activity of the process, and as such can be evaluated prognostically.—*Das Weisse Blutbild bei den verschiedenen Tuberkuloseformen nach Professor Neumann, R. Russew, Beitr. z. Klin. d. Tuberk., 1928, lxviii, 539.*—*(H. J. C.)*

Value of Arneth's Leucocytic Formula.—Reactions useful in the prognosis of progressive ("evolutive") tuberculosis are numerous. They include cutireactions, red-cell sedimentation, diazo-reaction, Arneth's leucocytic deviation, unfortunately too little used. All these express the actual state of defense of the body against bacillary attack, but they cannot forecast the future accurately unless repeated quite frequently and regularly. For three years the deviations of Arneth's formula have been studied by Stephani at Montana, Switzerland. It is recalled that Arneth divided the neutrophiles into five classes and obtained his index by multiplying the number of each class by the number of cells (out of 100) falling therein. He considered 276 a normal index, but later observations indicate this is too high and that 260 is about right for men and 240 for women. In infectious diseases Arneth's formula is deviated to the left,

giving lower indices; for instance, in a typical case of active bilateral fibrocaseous tuberculosis, 141. Stephani has found that in addition to the prime nuclear divisions or lobes there are small connecting filaments, and that the segments possess much smaller satellites or corpuscles. These are normally seen in 40 to 60 per cent of the neutrophiles, but in grave cases of tuberculosis they may fall to below 10 per cent or even to 0. To study these one employs a stain in which haematoxylin is first steamed for two minutes, after which the slide is inverted in a warm eosin solution. Studies were made on 100 tuberculous patients at Montana. An Arneth index lower than 170 is considered a strong deviation, and a corpuscle count of under 20 per cent is considered feeble. Sixteen patients in the series showed these low indices and of these 12 died quite rapidly. There were also 5 patients who died without showing low indices. Three of the four with low indices who did not die nevertheless continued to show more or less serious and incapacitating symptoms. The fourth had a pneumonic lesion of the upper half of the left upper lobe, which resolved in large degree in six months, together with a proliferating laryngeal tuberculosis. She finally was discharged in excellent condition and a good prognosis given. Thus, it appears that Arneth's formula, together with a low corpuscular count, was the forerunner of a fatal termination in 80 per cent of cases. *Explanations:* The polynuclears, that is, the neutrophiles in Arneth's classes III, IV and V, play a preponderantly defensive rôle in tuberculosis. They continue to form by segmentation of mono- and binuclear neutrophiles. A temporary capitulation to the tubercle bacillus is announced by an immediate diminution in the nuclear "corpuscles." If there is a polynuclear reserve, shown by the Arneth formula still being good, new polynuclears appear within a few weeks; if there is no such reserve, and the Arneth formula is bad, the patient is lost. These suppositions are in harmony with recent German work on liberation of antibacillary ferments due to polynuclear destruction. If these cells fail to be reproduced, the ferments will also be lacking.—*Le signe des noyaux ronds et le rôle des corpuscles nucléaires des neutrophiles dans la défense de l'organisme contre la tuberculose pulmonaire, J. Stephani, Rev. d. l. Tuberc., February, 1928, ix, 52.—(A. P.)*

Monocytes in Active Tuberculosis.—Two types of mononuclear cells can be differentiated by the "supravital" staining technique, namely, the monocyte, coming from the reticular cells in the bone-marrow, spleen, and lymph nodes, and the clasmatocyte, arising from cells which come from the endothelium lining the sinuses of the lymph nodes, the sinusoids of the liver lobules, and the capillaries of the bone-marrow, suprarenal cortex and hypophysis. The monocyte, seen in living preparation stained with neutral-red and Janus-green, is a fairly large round cell, with an oval or slightly indented nucleus usually eccentrically placed. In the mature cell there is a small ring of granules situated near the indentation of the nucleus. This ring of granules surrounding the centrosphere of the cell is made up of two or three concentric circles, forming a "rosette." These granules take the neutral-red stain. The clasmatocyte does not have a rosette. The work of Cunningham and others is quoted as showing that in actively progressive tuberculosis the monocytes increase, in some instances forming 50 per cent of the white cells, and the normal ratio between monocyte and lymphocyte is reversed. In arrested or healing tuberculosis the number of monocytes falls, and the ratio between monocytes and lymphocytes returns to normal. The results of blood examinations by supravital staining, in 17 patients, are reported. The first group of 12 patients had proved tuberculosis. Of these, 7 patients with acute miliary tuberculosis and 1 patient with generalized tuberculosis died. Four patients, one with pleurisy with effusion, two with peritonitis, one with inguinal lymph adenitis, recovered. In all of the 8 fatal cases (except one which was discharged when the diagnosis was made) the percentage and absolute number of monocytes rose steadily, increasing the monocyte-lymphocyte ratio to a figure far above normal. (Normal for 3 to 6 months being 1 : 10, ratio in 1 case of miliary tuberculosis being 1 : 1.2.) In the 4 cases with recovery, early studies revealed a high *M-L* ratio, later studies a low one. The authors were unable to substantiate definitely by the usual methods the diagnosis of tuberculosis in the second group of 5 unproved cases. But the patients with lower *M-L* ratios did better. In questionable cases a study of the blood by the supravital technique may lead to a correct diagnosis. When the diagnosis is established, supravital studies of the blood may be of prognostic value in indicating whether the lesion is progressing or regressing.—*The Monocyte in Active Tuberculosis, K. D. Blackfan and L. K. Diamond, Am. J. Dis. Child., February, 1929, xxxvii, 233.—(P. J. W.)*

Blood Changes in Pulmonary Tuberculosis.—The blood picture is a valuable aid in the diagnosis, prognosis and therapy

of tuberculosis. The author reports 140 selected cases, given various forms of therapy and presenting manifold differences in the blood picture. An ideal curve of the white blood cells is presented, by comparison with which the diagnosis, prognosis and effects of therapy can be better observed and evaluated.—*Morphologische Blutbilduntersuchungen bei Lungentuberkulose. Versuch einer Erweiterung der klinischen Deutung und Bewertung des morphologischen, weissen Blutbildes hinsichtlich Diagnose, Prognose und Therapie der Lungentuberkulose, und tabellarisch geordnete morphologische, weisse Blutverschiebungen in Serienuntersuchungen nach therapeutischen Eingriffen bei derselben, K. Steudtner, Beitr. z. Klin. d. Tuberk., 1928, lxviii, 353.*—(*H. J. C.*)

Potential Blood Alkalinity in Pulmonary Tuberculosis.—The potential blood alkalinity is usually diminished in pulmonary tuberculosis, more markedly so the more decompensated the process, while there is very little relation between it and the Turban classification. The diminution is more marked in exudative than in fibroid and productive phthisis. With the occurrence of clinical improvement the potential blood alkalinity increases, while complications proceed with a diminished alkalinity, especially those involving the kidneys. Every variation in the potential blood alkalinity is to be viewed as prognostically unfavorable. The changes in the potential blood alkalinity are usually inversely proportionate to those in the red-cell sedimentation and the leucocytic index.—*Potentielle Blutalkalescenz und deren Schwankungen bei Lungentuberkulose, T. D. Kahn, Zeitschr. f. Tuberk., 1928, l, 480.*—(*H. J. C.*)

Blood Uric Acid in Tuberculosis at High Altitudes.—The uric-acid content of the blood of healthy individuals is only 0.7 to 1.7 mgm. per cent at high altitudes compared with 3 to 5 mgm. per cent in the lowlands. There was no difference noted between men and women. During a febrile disease or tuberculous relapse the uric-acid values increased initially, while a diminution occurred later. Tuberculous individuals with a favorable disease course have normal values. There was no relation between the blood uric-acid findings and the leucocyte counts.—*Blutharnsäurewerte bei gesunden und tuberkulösen Menschen im Hochgebirge, P. Borchardt, Zeitschr. f. Tuberk., 1928, l, 473.*—(*H. J. C.*)

Vital Capacity in Tracheobronchial Tuberculosis.—Vital-capacity observations were made on a group of 200 children between the ages of 7 and 12. Each child had been exposed to an open case of tuberculosis and each had a positive Pirquet test. The vital-capacity readings were correlated with the physical signs and roentgen observations. The estimation of normal vital capacity was based on age, weight and the standing height, and three readings were made in each case. A deviation of not more than 10 per cent below the estimated standard for that child was not considered abnormal. The results showed that the vital capacity of each of the children was practically normal. Children 7 per cent and more underweight showed no more diminution in vital capacity than those considerably overweight. In fact, 30 who were 7 per cent or more underweight had, as an average, a slightly higher vital capacity than those of the normal or overweight group. This was also true of those who showed roentgenological and physical signs of enlarged tracheobronchial lymph nodes, 28 children with such evidence having vital capacities well within normal limits. Therefore, at least in the quiescent case of hilum tuberculosis, the estimation of vital capacity is of no value in diagnosis, although this may not be the case in active hilum tuberculosis showing clinical signs and symptoms.—*Is the Vital Capacity An Aid in the Diagnosis of Hilum Gland Tuberculosis? E. Friedman and J. B. Hawes 2d, J. Am. M. Ass., February 2, 1929, xcii, 363.*—(*G. L. L.*)

Acoustics of Percussion.—Many physicians believe that the art of percussion and auscultation is out of date, or that it has been supplanted by the X-ray and the tuberculin test. It is not only not supplanted by the X-ray, but is much more necessary in order correctly to interpret the X-ray picture. It has gained certainty since being controlled by the X-ray, for the films have enlightened us in regard to the errors of an over-refined technique of percussion and auscultation. When the physician is almost convinced from the symptoms that he is confronted with a tuberculous affection of the lung it requires no little self-criticism not to find some difference in resonance of the apices or somewhat sharper expiration on one side. It must be kept in mind that the breath-sounds are commonly not quite identical on both sides, even when healthy. On the other hand, primary foci the size of a pea or bean are ordinarily not located at the apices and not recognizable by auscultation or percussion. Auenbrugger's original work was in Latin, and Skoda, in his German rendition, has not always

used terms of identical meaning. He early recognized that such terms as "resonant" and "dull" are in themselves insufficient. Duration and amplitude of vibrations must be considered. The ear is able to perceive differences of less than one-half-second duration. In the slow dying away of the normal lung note it is always the deep fundamental tones that persist; in the absence of these, as over a pleural exudate, only a single vibration is recorded (Martini). The tympanitic note of the air-containing gastrointestinal canal gives pure sine curves, whereas the curve form of the lung note is much more complicated. Tympany, as heard over the chest and abdomen, refers to high-pitched sounds of 250 to 500 vibrations per second,—a high pitched, ringing sound, with absence of deep tones. Hoppe, and later Turban, demonstrated the rôle played by vibrations of the body-walls. If forcible pressure is brought to bear upon the posterior side of the chest-wall near the vertebral column, its vibratory ability is so weakened that there is true dulness in the form of a Rauchfuss triangle in adjacent parts on the opposite side. Turban explained that a massive pleural exudate dampened the vibratory ability of the backbone and adjacent ribs. The vertebrae set up resonant vibrations wherever resonant aerated lung lies paravertebrally. It is stated by d'Espine, Turban, Ranke and many others that by percussion of the interscapular space one can demonstrate enlargement of the hilum lymph nodes. Actually these nodes lie about in the middle of the thorax and mostly anterior to the dorsal spine, about the bifurcation. The fainter note often found in the lower paravertebral regions corresponds with the border of the cap of the trapezius muscle and is particularly well observed in healthy, muscular men, especially if the muscle is tensed. For actual enlargement of the hilar lymph nodes to be percussed from the back seems not very plausible when cardiac dulness or that from aortic aneurysm ordinarily cannot be. Again, dulness will be found wherever the chest-wall exhibits a sharp curve, but especially in kyphoscoliosis, at the peak of the bend. Organs within the body-wall are also set into vibration by percussion, except such soft nonresonant ones as liver, heart or muscles. The chest-wall in the vicinity of such organs, as is well known, shows diminished vibratory ability. Fahr and Brandi's experiments corroborate Martini in that "relative dulness," for instance, cardiac, is always found at the point where the overlying lung does not exceed 3 to 5 cm. in thickness. Thus we shall percuss the heart too small where the covering layer is of greater thickness, as over the right auricle and great vessels. The central structures of the chest (vena cava, aorta and pulmonary artery) only betray themselves if they are unusually close to the chest-wall, and percussion over the sternum yields unsatisfactory results. As to the vigor of percussion, Müller is satisfied that it makes little difference in determining the border of relative cardiac dulness. Goldschneider advocates minimal and Moritz vigorous percussion. From experimental observations it must be concluded that infiltrations, tumors or aneurysms, covered by more than 5-cm. thickness of lung, are not demonstrable by percussion. Pneumonia is rarely demonstrable within several days of the clinical onset and even then only if it extends near to the surface. There is no fixed normal percussion note and in a large series of healthy persons the apical note shows wide differences, often fainter in very muscular or fat individuals than in the presence of actual tuberculosis. Attempts to record the pitch of percussion notes are described, using phonographs and selective funnel-shaped resonators made of sheet zinc. The abdominal note was found to harmonize at a frequency of 250 vibrations per second. More difficulty was had with lung tones. With the use of condenser microphones and amplifying tubes it was found in many instances that the dominant tone was that of A major with 108 vibrations per second. Martini, with the Otto Frank apparatus, obtained curves showing 100 to 130 vibrations per second in the adult, and around 170 in the child. The deepest fundamental tone was over a pneumothorax, with 76 vibrations, corresponding to low E, the deepest bass note usually sung in Mozart's Magic Flute. The practised physician, however, considers not only fundamental tones but higher overtones. *Practical Percussion Methods:* It is most important that the finger or plexímeter be pressed firmly and constantly against the surface percussed, and that both distal phalanges be applied. Finger percussion is probably best for the heart and lungs generally speaking, but a light hammer, with a small rubber tip, such as that of Wintrich or Curschmann, makes perceptible certain higher overtones. The manner of striking and kind of instrument are important. Hard bony fingers are better than soft fleshy ones, the latter tending to dampen certain tones.—*The Teaching of Percussion, F. v. Müller, New England J. M., October 25, 1928, cxcix, 807.*—(*A. P.*)

Transmission of Sounds through Chest.—The only sounds from within the larynx to reach most of the chest surface in many normal adults are the lower-pitched

simple sounds of the voice. These are able to excite the lung into forced vibration and thereby slightly overcome the reflection which often totally obstructs higher-pitched sounds. The normal breath-sounds arise chiefly or wholly in the lungs, perhaps in the vibrations of the delicate pulmonary tissues, and set the chest-wall into vibration, though too feebly to be felt. In a partially collapsed lung there is more or less related or retracted but still aerated lung, which occurs typically over several interspaces anteriorly and above some large fluid collections. The reduced tension of the pulmonic tissue lessens reflection of sounds in general. In solid lung tissue the spoken, whispered and breath-sounds from the larynx lose most of their energy in passing from within the air passages to the completely consolidated lung. Over pulmonary cavities characteristic cavernous and amphoric sounds may result when cavities resonate suitable simple sounds from the voice whisper, breathing and râles. Relatively good conduction occurs if the cavity is directly in contact with the chest-wall or is separated from it by solid lung. In pneumothorax absence or marked loss of transmitted sound occurs, however slight the amount of air in the pneumothorax cavity, provided it is spread over a sufficiently extensive area and if no opening exists anywhere.—*The Transmission of Sounds Through the Chest, C. M. Montgomery, Am. J. M. Sc., December, 1928, clxxvi, 798.*—(*W. I. W.*)

Râles after Cough as Symptom of Cavity.—Following a moderately strong, soundless and short cough, the patient is instructed not to breathe for a moment. During this respiratory rest, râles may be heard if a cavity is present. The mechanism of these râles is explained by the fact that coughing compresses the cavity, and that during the following respiratory rest air is sucked into the reëxpanding cavity, producing râles in the presence of bronchial secretion. It is claimed that this phenomenon is sometimes the only demonstrable clinical sign for a cavity. This phenomenon is characterized by the fact that the râles occur after a short but definite period of silence, that they persist during a short period of respiratory rest, and that all or most of the râles are heard during the respiratory rest.—*Über das Phänomen des Auftretens von Rasselgeräuschen während des einen Hustenstoss folgenden Atemstillstandes, A. Winkler, Wien. klin. Wchnschr., November 8, 1928, xlv, 1550.*—(*M. P.*)

Origin of "Mill-Race" Cardiac Murmur.—The mill-race cardiac murmurs were described by Albert in 1922 and believed due to lacerated intercostal veins. These murmurs occur mainly in the right ventricle and are looked upon by Blum as the result of air having entered through the mediastinal space, which is not believed very plausible. The author reports a case of spontaneous pneumothorax, in which injury of the intercostal veins could not have come into consideration and subsequently he found these murmurs 49 times in 110 cases of pneumothorax. He looks upon them now as originating in the pleural space as the result of friction of pleuropericardial adhesions, the pleural space acting as a resonator to friction of the adhesions.—*Zur Frage der Entstehung des Mühlengeräusches, E. Tamarin, Zeitschr. f. Tuberk., 1928, l, 333.*—(*H. J. C.*)

Deceptions and Surprises in Pulmonary Tuberculosis.—There is no disease which presents so many and varied unexpected changes for better or worse, and so often deceives or surprises even the most experienced. A number of instances are cited in detail. One astonishing thing is the remarkable recovery of certain individuals who have been under no regulated rest treatment. Trudeau, who lived for sixty-seven years, may be cited, also the elder Bowditch, who began by riding about New England in an open chaise and later took daily walks throughout his life. It is possible that rest treatment may be carried too far and that, if one possesses enough of that unknown factor, "resistance," he is bound to recover, but as we are in ignorance of the nature of this, rest for all may be the safest procedure. Austin Flint prescribed large amounts of whisky for his tuberculosis patients, and many lived a rough and ready outdoor life with benefit. Too positive prognoses should be avoided on the basis of single visits and examinations, and external appearances are particularly deceiving. The value of the X-ray in correcting and confirming physical diagnoses is emphasized by one case cited. Chronic fatigue as a symptom of tuberculous disease is likewise emphasized. One is advised to avoid basing prognoses or estimation of activity on the extent or persistence of râles. Cases of haemoptysis without other symptoms or signs require careful consideration. Bronchiectasis should always be thought of in making differential diagnoses. When, after persistent and frequent search, no tubercle bacilli are found in the sputum, and especially if the signs are basal, it should be considered likely. Another deception is the effect of any new treatment and the ephemeral improvement from its use. This was

evidenced in a visit to the wards of the Brompton Hospital with Inman when Dreyer's tuberculin came into use.—*Some Deceptions and Surprises in the Course of Pulmonary Tuberculosis, E. O. Otis, New England J. M., November 29, 1928, cxcix, 1081.*—(*A. P.*)

Pitfalls in Diagnosis.—If the profession is going to continue to place reliance on physical signs and X-rays as a means of diagnosis, countless tragedies will continue to happen. The important point to recognizé is that the presence of the disease must be producing ill health and must be diagnosed from the history and symptoms. The commonest symptoms indicating active pulmonary tuberculosis are cough, fever, pain and lassitude. If doctors were trained to ask for a specimen of sputum when pulmonary tuberculosis is suspected there would be fewer unfortunates caught in a trap. A rectal temperature above 98°F., a.m., and above 99.4°F., p.m., should be considered fever, at all events in a man. In most men, in fact, a rectal rest temperature of 98°F., a.m., and 99.4, p.m., will be found to be one degree higher than the average temperature of health. The other causes of fever without definite signs of physical disease which may constitute pitfalls are (1) nerves; (2) microbic infections, such as endocarditis, lymphogranuloma, dysenteric liver or liver abscess, perinephritic infection; bone infection, nasal sinus infection, and typhoid or paratyphoid fever; (3) malaria, rheumatic fever, coliform infection, or syphilis,—these can often be eliminated by the administration of the proper drugs; and (4) neoplasm. There is evidence that neurosis alone can keep the temperature up as much as 1°F. When patients and doctors learn that tuberculosis is curable in the early stages in the majority of cases there will be less reluctance in diagnosing it. A common pitfall in connection with the diagnosis of pulmonary tuberculosis occurs through over-reliance on and mistakes in the practice of that very helpful aid to diagnosis—radiology. These errors can mostly be grouped around the following three causes; (1) incomplete cooperation between physician and radiologist; (2) imperfect technique, and (3) ignorance of what constitutes the normal. Of these the last mentioned cause of error is the commonest.—*Pitfalls in the Diagnosis of Pulmonary Tuberculosis, S. V. Pearson, Lancet, January 12, 1929, ccxvi, 59.*—(*B. T. Mc.M.*)

Early Diagnosis of Pulmonary Tuberculosis.—The physician does not err who (pending a definite diagnosis) treats all suspicious cases as positive. Early diagnosis is often made on probability rather than certainty. Physical and X-ray findings may be entirely negative in a positive case. *Conclusions:* It is manifest that the best method for determining activity is by correlation of clinical, laboratory and roentgenological data during a reasonable period of observation (say, one month) in a sanatorium. It must always be understood that activity is proved by the general rather than the local symptoms and that potential activity may continue long after clinical activity has ceased. An entertaining, expressive dialogue took place recently between an eminent specialist and his referred patient. The physician said: "So, you went to a general practitioner. What fool advice did he give you?" "Oh, he told me to see a specialist," replied the patient. The author believes with Brown of Trudeau Sanatorium that "Confidence born of knowledge rather than acuity of hearing is the chief difference between the general practitioner and the specialist," and, finally, accepts as sane and dependable and final his summary in the vital and difficult task of making sure in diagnosis, that "In order to make a positive diagnosis in pulmonary tuberculosis, one or more of the following diagnostic criteria must be present: haemoptysis of a dram or more; pleurisy with effusion; moderately coarse râles above the third rib and the third vertebral spine; a parenchymatous roentgen-ray lesion in the same area; and tubercle bacilli in the sputum.—*The Early Diagnosis of Pulmonary Tuberculosis, E. M. Ellison, M. J. and Rec., November 7, 1928, cxxviii, 437.*—(*B. T. Mc.M.*)

Progressive Phthisis in Middle Aged.—The influence of physiological crises, growth, puberty, pregnancy and the menopause on the development and course of phthisis has been the subject of much study. Of equal importance is the *crise du retour d'âge*, and the authors wish to add this period of middle age to the list. The incidence of tuberculosis in this age-period, according to the published statistics of American, Japanese, English and French writers, is the second highest and not infrequently the highest. The individual is usually a man, less often a woman, aged 45 to 50 but prematurely old, weak-willed, nervous, neurotic and commonly addicted to drink. For many years he has been a chronic cougher but there is no history of an attack of tuberculosis necessitating discontinuance of work. His symptoms have been accounted for by the abuse of tobacco or alcohol or some such reason; his general condition is poor and he is usually anaemic. The sputum contains tubercle bacilli, but in small numbers.

Physical examination may be misleading, as extensive disease may be present and disproportionately fewer abnormal signs; X-ray examination is more valuable. As a rule there is not much fever and the disease progresses without evoking much reaction. The pulse is important in determining the prognosis; if arteriosclerotic and of high tension it is favorable; if of low tension and weak it is grave. The best treatment is sanatorium and general care.—*La poussée cachectisante de la cinquantaine chez les tuberculeux fibreux ou chroniques, R. Burnard, Ann. d. Méd., October, 1928, xxiv, 277.—(B. T. McM.)*

Synchronization in Roentgenological Diagnosis.—By use of an ingenious apparatus a scheme has been devised by which an X-ray of the chest may be taken at any desired stage of the cardiac cycle. Exposures are preferably made in late diastole when cardiac movement is at a minimum. Exposures require only 1/20 to 1/40 of a second. The cardiac impulse tends to cause a straightening of the curved arteries in the elastic pulmonary substance and exposures of even 1/20 of a second, if made during systole, will result in a fine blurring of the shadows cast by the heart, vessels and hilum. When there is tachycardia, the hilar shadows are likely to be blurred, and this is of special importance in children with acute respiratory disease. The degree of visibility of the hilum depends upon (1) the type of chest, (2) the depth of inspiration, and (3) the condition of the lung before and behind the hilum. The latter state of affairs can usually be appreciated by routine oblique exposures, and the latter procedure will disclose the "pulmonary" location of much that is ordinarily called "hilum tuberculosis." The tracheobronchial lymph nodes must be either enormously enlarged or calcified if they cast individual shadows on the plate. Calcific infiltration casts a distinct, granular, crenated shadow. Trunk shadows may be prominent but this is not due to greater density of the wall from fibrosis or infiltration. It is probably due to the fact that the large trunks with infiltration are not readily set into vibration by the pulse wave.—*The Value of Synchronization in Accurate Diagnosis of Chest Diseases, F. M. McPhedran and C. W. Weyl, Radiology, December, 1928, xi, 458.—(H. S. W.)*

Lipiodol in Pulmonary Diagnosis.—Several methods for administration of lipiodol have been suggested, such as injection through the cricothyroid membrane or trachea with a syringe, or by means of the bronchoscope or laryngeal syringe and by catheter. In the latter method, the larynx is anaesthetized and the catheter placed in the desired bronchus (under the fluoroscope) and sufficient lipiodol injected, the amount being determined by the fluoroscopic appearance. The method is adaptable to the majority of conditions. Too much lipiodol or too concentrated a solution may simulate abscess of the lung. The drug is eventually absorbed by the tracheobronchial lymph nodes and may be mistaken in subsequent plates for calcification. For abscess of the lung, bronchoscopic administration is preferable, and a foreign body should be looked for before the drug is introduced. Likewise, in cases of tumor and haemoptysis in nontuberculous disease when specimens are required, the bronchoscopic route is best. Lesions in or near the hilum that involve or distort bronchi may be best visualized after the insufflation of bismuth subcarbonate. Lipiodol is contraindicated or used very cautiously in pulmonary tuberculosis, hyperthyroidism (because of absorption of iodine), advanced cardiac disease and high fever. Although of greatest use in bronchiectasis and abscess of the lung, lipiodol injections may also be of very great help in differentiating pleural from pulmonary lesions, in diagnosing aneurysm, tumor and pulmonary fistula and as an adjunct to thoracoplasty.—*Lipiodol in Its Relation to Chest Diagnosis, B. H. Nichols, Radiology, January, 1929, xii, 1.—(H. S. W.)*

Complement Fixation in Tuberculosis.—Approximately 800 patients were examined with the complement-fixation reaction, using the alcohol-soluble antigen of Neuberg and Klopstock. In active and apparently rather far advanced tuberculosis, 100 per cent positive reactions were obtained, but of 7 incipient cases only two reacted positively. In a number of nontuberculous diseases positive fixations were observed; this was particularly the case in patients who had positive Wassermann reactions. It is concluded that the result of the complement-fixation reaction, if a simultaneous serological test for syphilis is performed, is of definite clinical value.—*Untersuchungen über Komplementbindungsreaktion bei Tuberkulose, E. Stengel, Klin. Wchnschr., April 23, 1929, viii, 787.—(M. P.)*

Complement-Fixation with Neuberg-Klopstock Antigen.—Complement-fixation tests with the Neuberg-Klopstock antigen are recommended in cases suspected of tuberculosis. The author tested 200 cases, and found that among the quiescent cirrhotic cases it was positive in twice as many instances as was the red-cell sedimentation

test, as well as positive in 3 per cent more of the cases than the Pirquet test. Serological activity, however, does not parallel clinical activity, and a positive complement-fixation gives no indication of the patient's suitability for treatment, nor does it indicase the prognosis as well as the sedimentation reaction. It is only a diagnostic aid.—*Erfahrungen über das Neuberg-Klopstocksche Tuberkulose-Antigen, K. Siegfried, Beitr. z. Klin. d. Tuberk., 1928, lxviii, 558.—(H. J. C.)*

Matefy Test.—The Matefy test was performed, according to the original directions of Matefy, in 355 cases of pulmonary tuberculosis. In agreement with other authors the findings of Matefy could only be partially verified. The most marked flocculation occurred, as a rule, in exudative cases, and among these especially in the cavernous cases, even though two cases reacted negatively in spite of the fact that one was a third-stage case. Of the productive-cirrhotic forms 16 per cent reacted negatively. In the remainder of the cases the flocculation was less than in the exudative cases. Among 23 cases suspected of tuberculosis the test was negative in 40 per cent, while the remainder showed a flocculation up to ++. In cases with exudative pleurisy a more marked reaction persisted for a longer time. The reaction is not suitable for the determination of activity, since it is positive as frequently as negative in inactive cases and more markedly so the more extensive the process. Prognostically a negative outcome is to be viewed as favorable, while a four-plus reaction coincided with improvement in only exceptional cases. The red-cell sedimentation reaction proved more accurate and reliable.—*Über Matefy's Reaktion bei Fällen von Lungentuberkulose, S. Erlandsson and K. Akerberg, Beitr. z. Klin. d. Tuberk., 1928, lxviii, 527.—(H. J. C.)*

Vernes Flocculation Test.—If normal horse-serum is distributed in a series of small test-tubes and a suitable reagent is added to each, one factor being used in a fixed amount and the other in regularly decreasing amounts from left to right, there will appear in one or more zones of the series an opacity or flocculation, which in consecutive tubes may be seen to appear, increase, decrease, and finally disappear. If, in such an experiment, normal serum is replaced by infected serum and a suitable reagent is added to the infected serum, the zone of flocculation is displaced. The problem then is to find for a given infection an active reagent which produces flocculation in a well-defined zone characteristic of that infection, comparable to a band in the solar spectrum when responding to a known substance. This problem was first solved in syphilitic infections, an extract of horse-heart being used as the reactive agent. The degree of turbidity produced in the experimental tube is measured by means of an optical apparatus known as the Vernes-Brieq-Yvon photometer, and is expressed by figures of from 0 to one hundred and fifty (150) or higher on a graduated scale. The figures resulting from successive examinations of the same patient, recorded graphically, will give a curve corresponding with the rise and fall of the infection. During 1922 the serological problem described above was solved in connection with tuberculosis. For this disease resorcin was finally adopted as the reagent. The technique of the serum reaction with resorcin is briefly as follows: Blood should be drawn from the fasting subject, as only perfectly clear sera can be used (laked sera can be used). The serum is removed from the clot and centrifugated. If it is not clear it should be centrifugated again. It is possible, by decanting and centrifugating several times, to render chylous sera clear. Prolonged centrifugation heats the serum, and it is possible that turbidity may appear after cooling; in this case the serum cannot be employed. With the rheometer properly adjusted, 0.6 cc. of the patient's serum is introduced into a small tube; then an equal amount of a 1.25 per cent solution of pure resorcin in doubly distilled water is added; this is mixed by shaking without inverting the tube, and poured out rapidly into the receiver of the photometer, and the optical density of the mixture determined immediately, as flocculation may begin very quickly. The contents of the receiver are then emptied back into the corresponding tube, which is stoppered and kept at a temperature of from 18 to 20°C. for four hours. The specimen is then shaken without causing foam (by inverting), in order to separate the flocculant particles and to distribute them uniformly throughout the liquid. A second reading is taken and the first one deducted from the result. (The difference is the Vernes Index.) A control test should give results agreeing to within approximately three-hundredths. If the serum is perfectly clear a reading of 30 or above indicates tuberculosis. A serum reaction (false?) with a reading higher than 30 may occur in a small number of cases which are easily recognized. The chief of these are syphilis at the time of the chancre exclusively, soft sore, pneumonia with a high temperature, and cancer in its advanced stages. When the reading is from 0 to 15, with rare exceptions, the serum may be

considered normal; when from 15 to 30 there is an increasing probability of tuberculosis. Seroflocculation, the study of which is actually based on the examination of more than 23,000 sera, is for tuberculosis, as for syphilis, the interpretation of an alteration in the blood, which is in direct relation with the degree and evolution of the infection. The Vernes test is a useful practical method for the following problems: *1:* The elimination of the so called "larval" forms of tuberculosis (influenzal attacks, febrile gastric disturbances, bronchitis apparently of nontuberculous origin). *2:* The evolution and prognosis of collapse treatment. *3:* The nature of a pulmonary emphysema or of a pleurisy. *4:* The nature of a pulmonary focus giving noncharacteristic signs on auscultation and without radiographic or microscopic evidence. *5:* The nature of a focus of indefinite character in bone, joint or lymph node.—*The Phenomenon of Flocculation in Syphilis and Tuberculosis, A. Vernes, Brit. J. Tuberc., October, 1928, xxii, 165.—(J. S. W.)*

Serum Lipase, Lymphocytes and Tuberculin Reactions in Tuberculosis.—Reference is made to some studies carried out in 1923 under Zlatogoroff at Leningrad to determine the blood ferments in various infectious diseases, and the following conclusions reached: *1:* The blood ferments in infectious diseases differ from the normal. *2:* The lipase is strikingly diminished in typhus fever patients about the ninth to twelfth days. *3:* In children the lipase is more diminished in measles than in scarlet fever; in adults measles has little effect. *4:* Catalase and protease vary irregularly, while antitrypsin is slightly increased in both measles and scarlet fever, and markedly so in typhus. *5:* The blood ferments in the course of infectious diseases have a relative prognostic value. *Nature of Lipase:* This is a hydrolytic ferment, which splits fats into glycerine and fatty acids, discovered in 1896 by Hanriot in blood-serum. It occurs in bacilli, plants, grains, and certain organs, human and animal-liver, kidneys, pancreas, and other organs. Its origin is unknown, although Bergel assumes it is derived from the lymphocytes. Cornier found blood-serum lipase diminished in pulmonary tuberculosis and markedly so in those with purulent pleurisy, and increased under proper treatment and with improvement in condition. It is diminished in typhoid fever, scarlet fever and erysipelas, and following inoculation of guinea pigs with tubercle bacilli (Grineff). Marie and Fischer showed that it could dissolve the waxy envelope of tubercle bacilli and reduce the bacilli to fine granulations. Metalnikoff injected an emulsion of tubercle bacilli into the pods of *Galleria Melonella* and they were dissolved by a lipolytic ferment. Wolter and others corroborated the diminution in lipase content of the blood of the tuberculous but did not establish its relations to immunity. The studies here reported concern 8 clinically normal subjects and 36 affected in various degrees by tuberculosis. The former showed a lipolytic index (using Hanriot's scale) of 12 to 13, while the more severely affected tuberculous showed an index of 6 to 3. A sudden fall presages a fatal issue. At the same time Pirquet cutaneous tests were made on the forearm with Hoechst's O. T., in concentrations of 100, 30, 10 and 3 per cent. The cirrhotic and "follicular" (productive) forms of tuberculosis showed strongly positive reactions, the infiltrative (exudative) feeble reactions or sometimes entirely negative. When the blood-serum lipase was high the Pirquet reaction was strongly positive and diminished with the latter. Zieler has shown that the skin papules in a positive Pirquet contain giant cells, epithelioid cells and lymphocytes. It is also noteworthy that the Pirquet reaction becomes negative in measles, while the blood lipase and lymphocytes diminish. In infiltrative (exudative) forms of tuberculosis it has been shown that the lymphocytes commonly decrease by as much as 15 per cent. *Conclusions: 1:* The quantity of blood-serum lipase diminishes abruptly in infiltrative (exudative) forms of tuberculosis. *2:* In the follicular (productive) forms the Pirquet reaction is marked, while in the infiltrative (exudative) forms it is feeble or absent. *3:* In the follicular (productive) forms there is a lymphocytosis, and in the exudative a diminution of lymphocytes. *4:* The lipolytic ferment, lymphocytosis and a positive Pirquet reaction seem interrelated, and with the evolution of the disease their simultaneous determination is of biological and prognostic value as regards immunity.—*Le ferment lipolytique du sang, les lymphocytes et la réaction de Pirquet dans la tuberculose, Guegetchkori (Tiflis), Rev. d. l. Tuberc., June, 1928, ix, 390.—(A. P.)*

Red-Cell Sedimentation Reaction.—Of 318 clinically tuberculous cases admitted to King Edward VII Sanatorium, Midhurst, 309, or 97 per cent, gave an increased sedimentation rate with the Inman method. Of 42 clinically nontuberculous cases, 29, or 69 per cent, gave a normal figure, while in 13, or 31 per cent, the rate was raised. Thus, while an increased rate may be used in conjunction with the clinical findings to assist in the diagnosis of pulmonary tuberculosis,

its usefulness in this respect is lessened by the fact that other chest conditions give a high percentage of positive results, while a definitely tuberculous case may give a normal figure. As an indication of response to treatment, however, the test, performed at intervals of a month, and more frequently in pneumothorax cases, has a definite and unique value, and fluctuations in the rate can be closely correlated with clinical findings. Of 100 sputum-positive cases observed for not less than four months, the rate in those improved and arrested with negative sputum dropped from 23 to 12 per cent. In those who were improved but who still had a positive sputum the rate dropped from 32 to 22 per cent. In those stationary or worse it rose from 31 to 32 per cent. In artificial-pneumothorax cases there is typically a slight rise at the start, followed, in uncomplicated cases, by a steady fall to a normal level. Onset and withdrawal of fluid invariably cause a startling increase. The average fall in the rate of 20 pneumothorax cases was from 31 to 14 per cent. Of 11 patients who, though improved after at least four months' routine treatment still had a positive sputum, the average fall in sedimentation rate was from 20 to 10 per cent after sanocrysin treatment. In 6 of these 11 cases the sputum became negative. Experience has shown the wisdom of a guarded prognosis in a pulmonary (not pleural) case with an initial sedimentation rate over 30 per cent; and that nearly half of these cases do not respond satisfactorily without special treatment. Under 30 per cent the outlook is more favorable. The changes in rate during the first three months indicate not only whether or not the patient is responding to treatment, but the rate at which this improvement is taking place. A rising sedimentation rate means lack of response, and suggests the advisability of considering further treatment. If the significance of the changes and their degree in the individual case can be accurately gauged, it is considered that the test is of outstanding assistance to the clinician in his most difficult tasks, that is, the evaluation of treatment and the formulation of prognosis.—*Observations on the Sedimentation Rate in Pulmonary Tuberculosis, R. R. Trail and Doris M. Stone, Lancet, ccxvi, 179.*—(*E. H. K.*)

Red-Cell Sedimentation Reaction.—One hundred and forty-seven cases are reported in which blood sedimentation test combined with a serum reaction were made. In 136 the combination of the sedimentation and serum tests gave results which closely approximated those determinable by the usual method of diagnosis (symptomatology, physical signs and sputum examinations). In 11 cases the test findings were at variance with the clinical condition as indicated by such methods. On analysis of these 11 cases it was found that three negative tubercumet reactions occurred in patients with definitely active tuberculosis, in whom there was no evidence of a sharp decline. Two moderately positive tubercumet reactions occurred in patients with definitely advancing tuberculosis. From the above observations, one is not justified in drawing conclusions as to the worth of this method.—*Blood Sedimentation Test Combined with a Serum Reaction in the Diagnosis and Prognosis of Tuberculosis, E. M. Schloss and P. R. Miller, Am. J. M. Sc., April, 1929, clxxvii, 523.*—(*W. I. W.*)

Red-Cell Sedimentation Reaction.—The rate of sedimentation of red blood corpuscles was studied in 72 cases of pulmonary tuberculosis and 16 healthy people. The normal sedimentation rate of red blood corpuscles in men was 9.6. Each active case of pulmonary tuberculosis showed an abnormal rate of sedimentation. The sedimentation rate of red blood corpuscles in phthisis appears to be an accurate measure of the activity of a lesion, and as an additional clinical test it is of use in forming a diagnosis and prognosis.—*The Sedimentation Test in Pulmonary Tuberculosis, H. A. Clegg, Tubercle, February, 1929, x, 205.*—(*W. I. W.*)

Red-Cell Sedimentation, Matefy and Arneth Reactions.—The red-cell sedimentation and Matefy reactions are nonspecific for tuberculosis, but, according to the grade of the reaction, they indicate the severity of the disease, reflecting more accurately the activity of the process rather than the duration or the pathologicoanatomical form. The shift in the nuclei, according to Arneth, combined with these two reactions is of value. No diagnostic significance can be attributed to these reactions nor to the Arneth reaction. Prognostically they are only valuable on repeated examination.—*Erythrocytensenkungsreaktion, Matefyreaktion und Kornschub nach Arneth bei Lungentuberkulose, E. Kritschewskaja and R. Finkelstein, Beitr. z. Klin. d. Tuberk., 1928, lxviii, 336.*—(*H. J. C.*)

Tuberculin Reaction and Red-Cell Sedimentation.—There is no relationship between sedimentation rate and Pirquet reaction, a conclusion based upon a careful study of 124 cases.—*Bringt die Kombination von Alttuberkulin mit der Blutsenkungsreaktion eine Verbesserung den biologischen*

Diagnostik der Lungentuberkulose? P. A. Schmitt, Deutsche med. Wchnschr., December 21, 1928, liv, 2140.—(H. S. W.)

Cutaneous Tuberculin Diagnosis.—The author transplanted pieces of skin from tuberculous and healthy guinea pigs. If O. T. was injected intracutaneously into the transplanted skin shortly prior to or after transplantation, no tuberculin reaction occurred, but if the reaction had definitely occurred in the transplant before then the progression of the reaction continued. Contact of emulsions of tuberculous organs with O. T. at 37° diminished the O.-T. reaction, while similar contact with healthy-tissue emulsions had no effect. Likewise, suspensions of tubercle bacilli had a weakening influence, even though not as definite as that of tuberculous organs. According to the author it appears that cellular changes play an important rôle in Old Tuberculin reactions though humoral factors may also play a part.—*Experimentelle Untersuchungen zur cutanen Tuberkulindiagnostik, H. Koenigsfeld, Centralbl. f. Bakt., Abt. I, Orig., 1928, cvi, 111.—(H. J. C.)*

Tracheobronchial Tuberculosis.—Serial roentgenographs were made of 109 children between the ages of seven and twelve, each child having had intimate and prolonged exposure to an active sputum-positive case of tuberculosis, and each also having a positive skin tuberculin reaction. All other sources of infection which might cause symptoms, such as bad teeth, infected tonsils and adenoids were removed. The films were grouped as showing (1) normal chests, (2) suspicious chests, and (3) tracheobronchial or hilum tuberculosis. These films were studied and classified independently by three roentgenologists, a pediatrician and two specialists in tuberculosis, and the result was a wide discrepancy in the interpretation of the roentgenographs. No single case was considered positive by all six observers, five agreed on the pathology in only one case and four agreed on another case. Of the 29 cases considered to be tracheobronchial-node tuberculosis by at least one of the six physicians, 15 were considered positive by only one observer. The case considered positive by five out of the six observers was clinically a case of healed hilum tuberculosis. Study of 40 cases whose roentgenographs were considered normal showed four to have definite symptoms of active bronchial tuberculosis and to be in need of preventorium treatment. From this discrepancy of opinion, it should be evident that no diagnosis of hilum tuberculosis should be made on roentgenographic evidence alone. The presence of enlarged tracheobronchial lymph nodes, in the absence of clinical symptoms, does not necessarily mean either active or inactive hilum tuberculosis. Calcification of the nodes indicates a healing or healed process, and in the absence of clinical signs and symptoms institutional treatment is not needed. Definite and prolonged contact and a positive Pirquet reaction should be the chief requirements for selection of children for preventoriums and summer camps, special attention being given to those poorly nourished and underweight.—*Interpretation of Roentgenograms in Tracheobronchial Gland Tuberculosis: the Need of Standardization, J. B. Hawes 2d and E. Friedman. J. Am. M. Ass., February 23, 1929, xcii, 609.—(G. L. L.)*

Pathogenesis and Resorption of Pleural Effusions.—This study is a continuation of experiments attempting to explain the pathogenesis of oedema and ascites. It was shown in the previous work that oedema and ascites occur when the hydrostatic pressure in the capillaries becomes greater than the colloid-osmotic pressure in the plasma, regardless of the cause of this alteration. This explanation holds true for ascites due to hepatic cirrhosis, cardiac failure, and tuberculous peritonitis. In the present study pleural effusions caused by cardiac failure and tuberculous pleuritis were examined. It was found that only fluid with a low percentage of protein can filter through the pleura; when higher percentages of albumen are found this must be explained by a resorption of water and a concentration of the original fluid. It appears from the experiments that *Salyrgan* promotes the resorption of water from transudates. This mechanism is explained by the ability of *Salyrgan* to decrease the hydrostatic pressure in the capillaries. This explains, too, the fact that *Salyrgan* produces hydraemia.—*Pathogenese und Resorption von Trans- und Exsudaten in der Pleura (Salyrganwirkung), P. Iversen and E. H. Johansen, Klin. Wchnschr., February 12, 1929, vii, 309.—(M. P.)*

Tuberculosis of Larynx.—Laryngeal tuberculosis is found in about 10 per cent of all patients with incipient pulmonary tuberculosis. This percentage increases to about 50 per cent in more advanced cases. The Clinic Hajk has seen 715 cases of laryngeal tuberculosis since 1920. There were 503 male and 212 female patients. The preponderance of male patients is caused by the greater exposure to occupational injuries. Laryngeal tuberculosis is very rare in childhood. Most cases are seen in the third and

fourth decades. The frequency decreases at higher ages. The most frequent symptom is aphonia, which usually begins insidiously and with remissions. But it should not be forgotten that the lesions may not affect the vocal cords, and that, therefore, aphonia may be absent in the presence of laryngeal tuberculosis. The most dreaded symptom is dysphagia. It is caused by ulcerations near the entrance to the larynx and by perichondritis. Dyspnoea is rare, and is caused by stenosis due to excessive swelling. Macroscopically the beginning of laryngeal tuberculosis is marked by infiltration and by superficial ulceration. The ulceration may increase in size and depth and cause oedematous swelling, particularly in the aryepiglottic folds. Miliary tuberculosis of the larynx is rare and may be the first demonstrable lesion in haematogenous propagation. The differential diagnosis is concerned with tumors and syphilis. An excision of the diseased tissue is sometimes necessary to establish the diagnosis. The treatment depends largely on the pulmonary tuberculosis which is present in almost every case of laryngeal involvement. The therapy may be merely symptomatic to relieve pain, dysphagia and dyspnoea. For this purpose local anaesthesia with mentholated oil, orthoform, or cocaine is done. Alcoholic injection into the superior laryngeal nerve or its resection may be resorted to. Electrocoagulation of ulcers occasionally brings relief. Local, natural or artificial heliotherapy relieves pain in about 50 per cent of the patients. Dyspnoea may have to be treated by tracheotomy. The patient must be instructed not to talk. For local treatment 20 to 50 per cent lactic-acid applications are recommended. Circumscribed infiltrations on the posterior wall or on the epiglottis may be removed surgically if the general condition of the patient is good. Cauterization is indicated in superficial ulcerations. The effect of light therapy depends on the general condition of the patient. Success in treatment is chiefly insured by early diagnosis and by early treatment.—*Die Kehlkopftuberkulose, E. Wessely, Wien. klin. Wchnschr., February 7, 1929, vi, 176.*—(*M. P.*)

Treatment of Pleurisy.—The symptomatic treatment of pleurisy is considered important, while the use of tuberculin, autosero- and roentgenotherapy is cautiously appraised. Thoracocentesis is indicated in the case of distressing symptoms or limited nonresorbing effusions. Evacuation is advisedly considered. In quiescent cases exudate can be replaced with gas, but in early cases the displacement of an exudate by gas may be contraindicated.—*Die Behandlung der Pleuritis, R. Cobet, Zeitschr. f. Tuberk., 1928, l, 198.*—(*H. J. C.*)

Spontaneous Pneumothorax.—The commonest cause of spontaneous pneumothorax is the rupture of a tuberculous focus. In the majority of cases the onset is abrupt. The patient is seized with sudden sharp pain on the affected side and has marked dyspnoea. The pneumothorax may be open, closed or valvular. In many cases the air will absorb completely in three or four weeks. In pyopneumothorax, the pus should be withdrawn as soon as it is diagnosed.—*Spontaneous and Artificial Pneumothorax, A. Ramsbottom, Brit. M. J., March 9, 1929, no. 3557, 443.*—(*W. I. W.*)

Surgical Treatment of Tuberculous Pyopneumothorax.—The author reports the surgical treatment of 20 cases of tuberculous pyopneumothorax according to the method of Sauerbruch and his coworkers. In 10 of the cases pyopneumothorax developed after artificial pneumothorax, while in the other 10 it occurred spontaneously as a result of internal or external fistula-formation. The familiar irrigation of the mixed-infection cases did not appear superior to extrapleural thoracoplasty in the experience of the author. The cases with pyopneumothorax superimposed on an artificial pneumothorax were prognostically less favorable than the cases of spontaneous pyopneumothorax. The mortality of the former was 70 per cent as compared to 40 per cent in the latter. There was no great difference between the mortality of simple tuberculous pyopneumothorax (57.1 per cent) as compared with those with mixed infection (53 per cent).—*Die chirurgische Behandlung des tuberkulösen Pyopneumothorax, H. Hauke, Zeitschr. f. Tuberk., 1928, l, 304.*—(*H. J. C.*)

Treatment of Tuberculous Empyema by Replacement with Air.—Tuberculous empyema causes chronic ill health and disability, but can be treated satisfactorily by a relatively simple procedure, namely, by repeated replacement with air. Air replacement allows of gradual reëxpansion of the compressed, as well of the collapsed, lung and a gradual reduction of the mediastinal displacement, and therefore reduces to a minimum the risk of causing reactivation of pulmonary tuberculosis, and obviates distress to the patient. The essential feature of the treatment is the healing of the pleura promoted by contact with air instead of with fluid. The average number of replacements is ten, extending over a period of about a year. Patients are well enough to return

to work in about three months from the commencement of the treatment.—*The Treatment of Tuberculous Empyema by Replacement with Air, G. T. Hebert and W. E. Chiesman, Tubercle, March, 1928, ix, 257.*—(*W. I. W.*)

Clinically Primary Tuberculous Pericarditis.—Death occurs in tuberculous pericarditis from either heart failure or miliary tuberculosis, the latter being the more common. Miliary tuberculosis is much more frequent in this than in other forms of tuberculosis. In most cases, fluid is present in the pericardial sac and this fluid contains viable tubercle bacilli. It should be evacuated frequently. When it is impossible to do this by paracentesis, a pericardotomy should be done.—*Clinically Primary Tuberculous Pericarditis, J. A. Clarke, Jr., Am. J. M. Sc., January, 1929, clxxvii, 115.*—(*W. I. W.*)

Gastric Secretion in Phthisis.—It is commonly believed that in most cases of pulmonary tuberculosis the gastric secretion of hydrochloric acid is diminished. Knud Faber stated that achylia occurs in 33 per cent of cases. The literature does not show a general agreement with these ideas, and several workers have found hyperacidity in many, especially early cases. The author made a special inquiry into the history of 80 consecutive cases of early male adult pulmonary tuberculosis which showed that the incidence of digestive symptoms was not very high. Titration of acidity in 21 cases without digestive disturbance showed a slight tendency towards hypoacidity. The figures were not very widely divergent from those of a similar series of normal individuals. Of 18 cases with symptoms of indigestion, 77 per cent were normal and 23 per cent showed hyperacidity. There were no cases with decreased acid-secretion. Theories of chronic gastritis, anaemia of the gastric mucosa or even ischaemia of the whole digestive tract, which purport to account for an altered secretion, are merely guesses based on indefinite and probably fallacious data. The administration of hydrochloric acid to 24 cases selected at random of those suffering or who had suffered from indigestion, and to those who had never suffered from indigestion, did not show any encouraging results.—*Gastric Secretion in Phthisis, C.O.S.B. Brooke, Lancet, December 1, 1928, ccxv, 1128.*—(*F. G. P.*)

Functional Gastric Disturbances in Tuberculosis.—In tuberculosis there is a diminution of the gastric acidity as well as in the concentration of pepsin. The acid and the pepsin concentration do not always run parallel. In a third of the cases gastric motility was diminished. In rapidly progressive cases there was both motor and secretory insufficiency. With open tuberculosis tubercle bacilli are almost always found in the contents of the fasting stomach.—*Über funktionelle Magenstörungen bei Tuberkulose, F. Jäggi, Beitr. z. Klin. d. Tuberk., 1928, lxviii, 511.*—(*H. J. C.*)

Tuberculous Enterocolitis.—Intensive study was undertaken in a group of 80 patients with various forms of dyspepsia indicating enteric tuberculosis. They were grouped clinically as follows: *Class 1:* Comprising cases of mildly active or quiescent pulmonary tuberculosis with recent dyspeptic upsets, without physical abdominal anomalies. *Class 2:* Comprising 41 cases of active or quiescent pulmonary tuberculosis with digestive upsets of varying duration and localized physical abdominal anomalies of mild degree. *Class 3:* Comprising 32 cases of commonly active pulmonary tuberculosis with pronounced digestive upsets and widespread physical anomalies. In class 1 there was an absence of symptoms suggestive of extensive disease, but rather manifestations of mild, stimulant and irritant interference with neuromuscular function of the ileocaecal region. Localized disease was evidenced on physical examination. The roentgenological evidence was indefinite. In this group appendicectomy and rectal-fistula operations had been performed in 3 cases. In class 2 there was usually alternating diarrhoea and constipation, the abdomen was rarely free from pain, dehydration and malnutrition were constant, there were marked physical abdominal signs, and the roentgenological evidence was that of deforming hyperplastic lesions in the ileocaecal region. The disease was slowly progressive and the patient usually lived a year to several years. In 7 patients there were rectal fistulae and in 3, rectal abscess. In class 3 both pulmonary and enteric lesions were very progressive, toxaemia pronounced, and the intestinal walls involved over wide areas from mucosa to peritoneum, with little or no evidence of reparative effort. Abdominal symptoms were very marked, perforation and peritonitis occurred frequently, and roentgen examination always revealed definite pathological changes. In class 1 actual deforming lesions, affecting only the appendix or a small area of terminal ileum or caecum, were difficult to demonstrate roentgenologically. In a person with pulmonary tuberculosis, irritability and spasm in this area, even though slight, should be considered as tuberculous until proved

otherwise. In classes 2 and 3 roentgen studies uniformly revealed gross, deforming lesions. It is the opinion of the writers that active therapy should be directed toward such patients as in class 1, with slight dyspeptic attacks. Early laparotomy should be performed, and the localized disease removed surgically. In class 2 surgical exploration should depend on the condition of the pulmonary lesion and whether the bowel disturbance is limited to the ileocaecal region. In class 3 surgery is contraindicated. The diet should be arranged so that digestive absorption leaves scant residue. Raw milk is not permitted, but should be citrated. or parboiled. Overfeeding should be avoided. The fattening process common in the dietetic management of tuberculosis does more harm than good, throwing too great a burden on the alimentary tract. Confinement to bed is necessary, not only for fever, but until spasm, diarrhoea, nausea and vomiting have disappeared. In some instances heliotherapy relieves pain and promotes general comfort. The pains and constipation of early enterocolitis can be relieved by one ounce of liquid petrolatum four to six times daily. Warm cottonseed oil per rectum retained through the night is helpful. With spastic contractures orthoform, 20 grains, and extract of belladonna may be added. In the late stages the diet should be fluid, and the diarrhoea controlled medicinally by bismuth subgallate or by irrigating the bowel once or twice daily with sodium-chloride solution, along with opium medication. In some cases irrigation with warm solutions of silver nitrate, tannic acid or mercurochrome prove helpful.—*Tuberculous Enterocolitis, F. Smithies, M. Weisman and F. Fremmel, J. Am. M. Ass., December 22, 1928, xci, 1952.*—(*G. L. L.*)

X-Ray Studies of Colon in Pulmonary Tuberculosis.—Roentgenologic-anatomical studies were made on the colon of patients with pulmonary tuberculosis. By recording all the final readings uniformly in the upright position of the subject and by expressing the levels and distances by means furnished by the individual's own skeleton, the writers believe they have avoided the usual pitfalls in collecting data of similar nature. The caecum was found on the *linea terminalis* in 50 per cent of the males and in about 47 per cent of the females, and in the pelvis minor in about 23 per cent of the males and in about 43 per cent of the females. The hepatic flexure was an acute angle, and the first portion of the transverse colon lay parallel with the ascending colon for half of the length or less of the ascending colon in about 41 per cent of the males and 30 per cent of the females, and for more than half of the length of the ascending colon in 22 per cent of the males and in about 35 per cent of the females. The transverse colon was found in all but 3 males and 2 females at a lower level than the greater curvature of the stomach. The most dependent portion of the transverse colon reached below the level of the *promontorium* in about 65 per cent of the males and about 93 per cent of the females. The lowest point of the greater curvature of the stomach reached lower than the level of the third lumbar vertebra in about 95 per cent of the males and 98 per cent of the females. It was found below the level of the *promontorium* in about 21 per cent of the males and about 51 per cent of the females. Perfect fusion, nonfusion, imperfect fusion and irregular fusion of the layers of the great omentum were judged by the relative position of the stomach and the transverse colon as seen during roentgenoscopic examination and found by palpation and roentgenographs. A perfect fusion (1) was inferred in 50 per cent of the males and in only about 21 per cent of the females; nonfusion, that is, an absence of the so called gastrocolic ligament in about 23 per cent of the males and in 48 per cent of the females; an imperfect fusion in 20 per cent of the males and in about 25 per cent of the females; and an irregular fusion was deduced in about 3 per cent of the males and in about 3 per cent of the females. Adhesions between the ascending and the transverse colon were inferred in about 49 per cent of the females, between the transverse and the descending colon in about 29 per cent of the males and in about 44 per cent of the females.—*Roentgen-Anatomical Studies of the Colon in Patients with Pulmonary Tuberculosis, H. L. Sampson and B. Halpert, Am. J. Roentgenol. & Rad. Ther., January, 1929, xxi, 37.*—(*W. I. W.*)

Tuberculosis of Pancreas.—*Case Report:* A male patient, aged 66, was admitted to the Victoria infirmary, deeply cyanosed and in a state of collapse. Breathing was labored, temperature 99.4°, and respirations 32. The patient died two days after admission. Postmortem examination revealed that the left lung was firmly adherent at the apex and studded with tuberculous nodules. The pancreas was congested and firm. On section a large area of haemorrhage extending into the body of the organ and small areas of necrosis were noted. The rapidity of the fatal symptoms was caused by the absorption of the protein derivatives due to the action of pancreatic juices on its own necrosed tissue.—*Acute Haemorrhagic Pancreatitis with Tuberculous Disease of Pan-*

creas, J. A. M. Cameron, Brit. M. J., February 23, 1929, no. 3555, 344.—(W. I. W.)

Treatment of Surgical Tuberculosis.—The principles which should be considered in the treatment of surgical tuberculosis are: *1:* Preventive treatment to cut off the sources of infection, or reduce the dosage, and to maintain the subject's resistance at a high level. *2:* Early diagnosis as a basis of early treatment. *3:* Thorough treatment, which should be begun early, persisted in over a sufficient period, in what is essentially a chronic and remittent disease, and directed to the general as well as the local condition of the patient. *4:* Provision of facilities for supervision over many years to guard against relapse, or recognize it as soon as it occurs. *5:* Guidance of the healed case in the choice of a vocation, so that he shall avoid occupations which put a direct strain on the once damaged tissues.—*The Care of the Tuberculous Cripple, M. Forrester-Brown, Brit. J. Tuberc., January, 1929, xxiii, 17.—(B. T. McM.)*

X-Ray Treatment of Bone and Joint Tuberculosis.—The mode of action of X-rays on extrapulmonary lesions is still a matter of controversy. It has been shown that the lymphoid cells of the tubercle are the most sensitive structures in regard to X-rays. The epithelioid cells are less sensitive and are hardly affected by the usual dosage of X-rays. It may be concluded, therefore, that the destruction of lymphocytes and leucocytes liberates substances which act on the tuberculous process. All X-ray therapy must be combined with the usual orthopaedic, therapeutic and hygienic measures. It must, however, be strictly avoided to combine any other local treatment with X-ray therapy, such as heliotherapy, tuberculin administration, or the local application of iodine. These measures increase the susceptibility of the focus to X-rays, and they may cause a violent reaction. Operations should as a rule not be done before a period of conservative X-ray treatment has not proved successful. Free sequestra should always be removed surgically. The various forms of bone and joint tuberculosis react with a different amount of success to X-ray therapy. Dry fibrous arthritis is most easily influenced. Simple hydrops usually reacts well. Advanced joint tuberculosis with considerable destruction of bone, lesions with sinuses which are secondarily infected, should always be subjected to X-ray therapy. Closed fungating processes are rather resistant to X-ray therapy. The localization and the size of the bone or joint is not of great importance in the indication for the treatment. One finds generally that young individuals and the very old react best to X-rays. The dosage must be adapted to the type of lesion. Soft infiltrated lesions must receive much smaller amounts of rays than fibrous or torpid foci. The dosage varies very much according to different authors, but a study of the literature shows that the reported results are the better the smaller the dosage employed. Treatment should never be started with more than 5 to 10 per cent of the erythema doses. In active and acute lesions the initial dose should be a fraction of 1 per cent of the erythema dose. Increase of swelling, temperature, or secretion indicates a reduction of rays or an increase in the intervals between treatments. Several series of treatments with intervals of three to twelve weeks may be necessary. Other forms of local treatment may be employed during the intervals. The most important consideration in X-ray therapy is to avoid too strong reactions, and one will find that the best results are obtained with extremely small dosage of X-rays.—*Röntgenstrahlentherapie der Knochen- und Gelenkstuberkulose, J. Palugyay, Wien. klin. Wchnschr., November 1, 1928, xliv, 1522.—(M. P.)*

Joint Tuberculosis.—Using operative fusion in conjunction with heliotherapy and bed-rest, the results of treatment of 60 cases of joint tuberculosis with an average follow-up period of two and one-half years show that 32, or 53.3 per cent, have good or excellent results, 17, or 28.3 per cent, failed to respond to surgery, while 11 are still under treatment. Those successfully treated spent an average of forty months each in hospitals before surgery was resorted to, and were discharged, on an average, nine months after surgical treatment. All joints were fused except in 4 cases of tarsal amputation. The average age in the successful group was four years less than in the unsuccessful group. In knee-joint and tarsal involvement there was 85 and 87 per cent of success. Spines showed about 50 per cent of successes. The highest percentage of failures was in hip-joint involvement with associated sinuses and generalized tuberculosis in most instances. It would seem, however, that operative fusion offers the quickest means of restoring the patient to normal life, and is by far the least expensive method in the long run, although those with multiple foci do not respond well to surgery.—*Joint Tuberculosis: a Study of Operative and Unoperative Treatment of Sixty Cases from Social and Economic Aspect, M. Cleveland and E. Pyle, J. Am. M. Ass., May 4, 1929, xcii, 1496.—(G. L. L.)*

Tuberculosis of Hip.—Tuberculosis of the hip is probably never cured with useful motion; therefore surgical fixation of the joint in children is justified. Intraärticular fixation is usually unsuccessful, as it is impossible as a rule to get enough healthy bone in contact within the diseased joint. Fixation should be done as early as possible, both as regards the age of the patient and the duration of the disease, and the extraärticular operation affords a means for this early fixation. The juxtaärticular methods of Kappis and Hibbs, as well as the author's method of inserting a free graft from the trochanter and upper end of the shaft into the best possible groove in the roof of the acetabulum, provide better results than the paraärticular method of Albee. It is safe to operate in the presence of active tuberculous disease, even with abscess, if there is no open sinus. Even though fixation does not occur promptly after the operation, the graft provides an internal splint which relieves symptoms and prevents spread of the disease. The operation does not interfere with growth. Shortening is only that present before operation. Flexion of from 20 to 40 degrees in midposition is the position of choice. In the author's series of 17 patients who had the juxtaärticular operation of Hibbs firm bony union resulted in all but five. Good function is present in all but two, and in all cases the progress of the disease and all symptoms have been stopped.—*End-Results of Extra-Articular Fixation of the Tuberculous Hip in Children, F. C. Kidner, J. Am. M. Ass., December 15, 1928, xci, 1865.*—(*W. I. W.*)

Tuberculosis of Spine.—All that can be reasonably expected of operative fusion for tuberculosis of the spine is the development of bony ankylosis. In well conducted operations the mortality is low. The writer reports the results of operation on 301 patients from 1912 to 1925 inclusive, Albee's method used in 269, and Hibbs's in 32. There were 16 patients from 1 to 10 years of age, and 18 from 11 to 20. The average duration of symptoms was three years. Tuberculosis was present elsewhere in the body in 101 cases, pulmonary tuberculosis in 65. These were not operated upon until the pulmonary lesion was at least quiescent, with negative sputum. Results were classified as excellent, good, fair, poor and fatal, group 1 comprising those fully restored to their former duties without symptoms, group 2 those able to earn a living at light work, with perhaps a few symptoms, and group 3 those in which there was moderate improvement. In selection of cases, renal tuberculosis was eradicated before spinal fusion. The presence of a draining abscess does not contraindicate operation, but the sinus must not be in proximity to the operative field. As a rule, results in children operated on before the age of puberty were not good. Postoperative care consists of the use of the Bradford frame for 6 to 12 weeks, then a brace or a cast for at least a year, with heliotherapy and tonics. Of the total number, excellent results were obtained in 33.7 per cent, good in 18.1, fair in 15.5 poor in 12.1, and fatal in 20.4 per cent. Therefore, definite improvement was noted in 67.3 per cent and highly satisfactory results in 51.8 per cent, which definitely establishes the procedure as beneficial. Operative results were better in cases in which the lumbar region was affected. The length of time usually necessary to complete convalescence in groups 1 and 2 was nearer two years than one, and those in better economic position improved much faster. It is useless to subject patients with advanced tuberculosis of the lungs or of the genitourinary tract to this operation, for it merely provides a permanent splint and does not eradicate the disease. Practically all the 20.4 per cent who died had dissemination by way of the lungs, meninges or genitourinary tract. All patients left the hospital except three, who were considered as an operative mortality of 1 per cent.—*Operative Fusion for Tuberculosis of the Spine: Report of Three Hundred and One Cases, M. S. Henderson, J. Am. M. Ass., January 5, 1929, xcii, 45.*—(*G.L.L.*)

Fusion of Vertebral Bodies in Spinal Tuberculosis.—At the clinic of the Lakeville State Sanatorium, Middleboro, Massachusetts, there are now 86 cases of Potts disease under treatment, constituting approximately 45 per cent of all extrapulmonary tuberculosis at the Sanatorium. The only practical criteria of cure are (1) absence of local and general symptoms, and (2) bony fusion, as determined by lateral roentgenographs. "Fusion" implies that process of healing by which two or more vertebral bodies become welded together, rather than a fusion of spinous processes and laminae, and is brought about by nature rather than operative measures. The cases here presented were admitted from general hospitals throughout Massachusetts and observed for a minimum period of two years. All cases, operative and nonoperative, are treated by local immobilization and absolute recumbency until there is definite roentgenographic evidence of (1) complete or partial bony fusion, or (2) regeneration of calcium. Some are immobilized by plaster jackets, others on Bradford frames, and still others on anterior or posterior frames or shells.

Several nonoperative cases are reported which resulted in fusion of the vertebral bodies. Uninterrupted recumbency is necessary, as it is the weight of the superimposed bony column and the continual pounding or jarring by ambulation which favor destruction of bone in the average progressive case. In this first group, nature has responded, first by disintegration and disappearance of the intervertebral discs, second by collapse of the vertebral bodies, and finally by healing by fusion. The osteoplastic operations attempt to convert the spinous processes, laminae, etc., into a solid sheet of bone. If performed at the wrong time they defeat the purpose of treatment, that is, fusion of the articular constituents, by holding the intervertebral space so far apart that bone-cells can not bridge the gap. This subject was recently investigated by the Commission on Ankylosing Operations of the Spine of the American Orthopedic Association, which reported that operation does not prevent increase of destruction nor of deformity. Steindler regards it as only an incident of treatment, since fixation and mechanical support must always follow it for a considerable period. Union between the affected bodies, if it exists, is at best a soft fibrous one in which new trauma or other unfavorable factors may awaken the dormant process and cause recurrence of acute symptoms or establishment of secondary foci. For this reason the mortality is high and 25 per cent of the cases show multiple lesions. Z. B. Adams, of Boston, has recently voiced a sane and conservative attitude toward osteoplastic operations thus: "It is a great deal better to get the bone in a state of healing before a graft fusion is attempted." At Lakeville it is believed that the spinal operations hold an important place in the treatment of vertebral tuberculosis only after failure of conservative measures. *Conclusions: 1:* The ideal end result or cure in . . . . spinal tuberculosis is reached when there is definite bony fusion of the affected vertebral bodies. *2:* To attain this goal, prolonged uninterrupted recumbency is imperative. *3:* By conservative therapy, vertebral fusion takes place sooner, as well as surer, than through operative measures.—*Tuberculosis of the Spine, with Particular Reference to Fusion of the Vertebral Bodies, H. Ragolsky, New England J. M., March 21, 1929, cc, 608.*—(*A. P.*)

Renal Tuberculosis.—A report is given on 60 cases of renal tuberculosis in which nephrectomy was performed during a period of nine years at Bellevue Hospital. The average postoperative period was five and one-half weeks, and there were 12 deaths. Tubercle bacilli were found in the urine in a high percentage of cases, 39 per cent in bladder urine, and 54 per cent in ureteral urine. Genital foci were present in 27 of 54 cases examined, which high percentage suggests that renal involvement should be looked for in all cases of genital tuberculosis. Pulmonary involvement was also fairly common (25 per cent), and pus in the urine in these cases should direct attention to the kidneys. Tubercle bacilli were found in the urine in only 11 of the cases of genital tuberculosis. Prognosis depends largely on tuberculosis elsewhere than in the urinary tract. If the active lesion is confined to one kidney only, the prognosis is good. There is no constant relation between the duration of symptoms and the degree of renal involvement. Functional tests of the diseased kidney give a fair idea of the amount of kidney destruction. There are occasionally some cases, however, in which the tuberculous kidney exhibits the better functioning capacity of the two. The ureter corresponding to the affected kidney is almost always involved along with the kidney. Spinal anaesthesia not only renders nephrectomy easier to perform than general anaesthesia but offers hope in solving the problem of postoperative pulmonary exacerbations.—*Renal Tuberculosis: Analysis of Operations During the Past Nine Years in the Bellevue Hospital Urologic Service, H. S. Jeck, J. Am. M. Ass., January 26, 1929, xcii, 300.*—(*G. L. L.*)

Renal Tuberculosis.—For a long time it has been firmly believed that renal tuberculosis never heals spontaneously. This statement is true if one takes into account only those moderately large, destructive lesions on which operation is imperative. However, anatomical and pathological investigation, especially study of serial sections of large portions of kidneys, has revealed the fact that an astonishing number of small tuberculous lesions heal spontaneously. This has led to the idea that it is very probably true that we recognize clinically only the occasional instance which for some reason has not healed but has become progressive. Immunity from antecedent infection must also play an important part in the healing of a certain amount of renal tuberculosis. It has been stated that the normal, intact renal epithelium may transmit tubercle bacilli to the urine without the occurrence of renal injury. But, in view of the anatomical studies referred to, such a contention would be exceedingly difficult to prove. Urologists should evaluate suspected cases only after careful examination

of all available evidence and should bear in mind the possibility of minute foci of tuberculous infection of benign nature.—*Tuberculosis of the Kidney, G. Dalldorf, Am. J. Surg., August, 1928, n. s. v, 114.—(H. S. W.)*

Renal Tuberculosis.—Renal tuberculosis was found in 2.1 per cent of 1,112 sanatorium patients and among 2.8 per cent of 418 open cases of pulmonary disease. Urogenital tuberculosis presents predominantly the disease picture of secondary tuberculosis. The combination of tuberculous spondylitis with renal tuberculosis was frequent, for among 39 cases with spondylitis 5 had renal tuberculosis. Of importance in early diagnosis is the finding of pus in a sterile urine. With the slightest suspicion of renal tuberculosis animal inoculation of the urine should be resorted to. Prostatic or epididymeal tuberculosis calls for a complete urological examination. The indications for nephrectomy depend upon the activity of the pulmonary and renal lesions.—*Beitrag zur Klinik der Nierentuberkulose, mit besonderer Berücksichtigung der Frühdiagnose und der Indikationsstellung zur operativen Behandlung, J. Steiger, Beitr. z. Klin. d. Tuberk., 1928, lxviii, 406.—(H. J. C.)*

Nonsurgical Renal Tuberculosis.—Tubercle bacilli may be present in catheterized urine when no clinical urological tuberculosis exists. No laboratory test alone should make the diagnosis in the absence of a positive pyelographic examination and diminished secretion of urea and phthalein. Bacillaemia and bacilluria without actual tuberculosis of the kidney may lead to acute changes resembling nephritis. Numerous writers have found tubercle bacilli in the urine in as many as 10 per cent of patients with pulmonary tuberculosis, none of whom showed any evidence of renal tuberculosis. One case reported by the author with virulent tubercle bacilli (animal inoculation) in the urine underwent a nephrectomy operation, the organ showing no gross or histological evidence of tuberculosis. There was evidence of nephritis and pyelonephritis. There was a stricture of the ureter. During the interval between inoculation and autopsy of the guinea pigs the patient was being treated by weekly irrigations and ureteral dilatations and was improving. The toxic nephritis and pyelonephritis is thought definitely to have been due to the excretion of tubercle bacilli and to have been accentuated by the stricture which produced a certain amount of stasis. Bilateral renal tuberculosis is not a common disease. When it does occur, it is usually in a person who has demonstrable tuberculosis elsewhere in the body. In such cases the urinary bladder is always involved either symptomatically or pathologically. Secretion of urea is a valuable criterion as to the degree of renal damage. The combined method of blood chemistry and functional tests is of great value. If diagnosed early, it is usually wise to remove the organ having the most disease, the patient being kept under careful regimen for a long period afterward. If both organs are involved and both show materially diminished function, nephrectomy is to be avoided and medical treatment carried out. If there is pyelonephritis, weekly cystoscopic treatments with dilatation of the ureter and irrigation with an antiseptic, such as acriflavine 1 to 1000, should be carried out. Histological examination points to instances of cure of renal tuberculosis, and conservative medical and urological treatment should be employed more often, before resort to surgery is had.—*Non-Surgical Renal Tuberculosis, R. Gutierrez, Am. J. Surg., August, 1928, n. s. v, 99.—(H. S. W.)*

Medical Treatment of Genitourinary Tuberculosis.—A survey of the records of the New York Hospital for the last five years shows that nephrectomy for tuberculosis was done 40 times. All of the patients still live, but many of them are invalids who have very troublesome genitourinary or general symptoms. It should be realized that nephrectomy does not meet the entire needs of the patient because he generally has tuberculosis in some other situation in the body. Medical care of postoperative or inoperable cases is very necessary and should include a careful regimen of diet, hygiene, heliotherapy, tuberculin therapy and local treatment such as ureteral irrigation, etc. Close coöperation between surgeon and phthisiologist or internist is of the greatest importance in such circumstances. However, medical treatment is to be regarded as an adjunct to and not necessarily a substitute for surgical treatment.—*Treatment of Inoperable and Postoperative Urinary Tuberculosis, W. R. Delzell, Am. J. Surg., September, 1928, n. s. v, 209.—(H. S. W.)*

Male Genital Tuberculosis.—Epididymectomy in genital tuberculosis can usually be done and is much to be desired over orchidectomy, which is generally unnecessary. This statement holds even in face of the fact that more than one-half of all patients develop a second epididymitis later. The operation is done under either local or spinal anaesthesia and is in the nature of an exploratory operation. If removal of the testicle is indicated after incision, it is removed; if not, it is not removed.

Operation, however, is usually palliative, since a large percentage of patients have clinical tuberculosis elsewhere in the body and generally do badly. Tubercle bacilli are very rarely found in the urine in extra-renal genital tuberculosis. The only adequate treatment is the treatment of the disease as it affects the whole body. More important than the operation itself in most cases are the prolonged rest and the general management such as can be given only in sanatoria. As regards operation, however, the smallest and least radical procedure that is commensurate with the circumstances is to be advised.—*Male Genital Tuberculosis, A. T. Osgood, Am. J. Surg., September, 1928, n. s. v, 212.*—(*H. S. W.*)

Treatment of Genital Tuberculosis.—De Smeth's observations concern 30 cases in males, including both private and hospital clinic patients. He divides these into two main groups according to circumstances: (1) those who can undergo a prolonged period of treatment and (2) those whose occupations or economic exigencies require a rapid solution. He subdivides the first group into (1) those with a simple localized epididymeal focus without any other appreciable lesion, (2) those with lesions of epididymis, testis, prostate, and seminal vesicles, and (3) those with also pulmonary or osseous tuberculous lesions. Those with renal tuberculosis are excluded from this category as hardly amenable to improvement by any prolonged medical treatment and as requiring early operation (nephrectomy) with but few advocates of a contrary policy. The second chief group (poorer classes and small bourgeoisie) includes also professional people who have not the means for prolonged treatment or will not submit to it,—lawyers, physicians, etc. The great majority of the first group secure remarkable results from heliotherapy and actinotherapy. Double fistulous tuberculous epididymitis may be reduced to a single small nodule on one side, rapidly cured by epididymectomy. Prostatic and vesicular lesions, on the other hand, seem very little influenced. Artificial heliotherapy can be more rapidly and regularly applied than natural sunlight, and there is little difference in the results. To turn to the second class, all with simple genital tuberculosis are amenable to surgical treatment, except when the general condition is poor, when a preliminary rest and light cure is to be advised. What kind of surgery should be performed? Radical removal of prostate, vesicles and epididymes is not advised. De Smeth limits himself to simple or double epididymectomy according to extent of the lesions, castration being left as a last resource. Of 10 patients undergoing epididymectomy, all are in satisfactory condition. Two had reimplantation of the vas into apparently normal testes. All still have prostatic or vesicular nodules, but no symptoms. The practitioner is cautioned against the mistake of assuming that there is a urinary tuberculosis when there is no haematuria and no painful or frequent urination, even though the urine contains tubercle bacilli, when there are present genital lesions. Cystoscopy and ureteral catheterization are to be avoided when there are no vesical symptoms in such cases, as one may aggravate the genital lesions. *Summary:* Heliotherapy, actinotherapy and epididymectomy yield equally good results in suitable cases. Physical agents have the advantage of preserving the integrity of the spermatic passages and the hope of procreation, but at times initial radical excision of the diseased parts (when localized) may be considered preferable for the individual and society.—*Le traitement de la tuberculose génitale chez l'homme, J. De Smeth, Rev. Belge d. l. Tuberc., May-June, 1928, xix, 106.*—(*A. P.*)

Tuberculous Salpingitis.—Although tuberculous salpingitis is commonly associated with ectopic pregnancy, the clinical manifestations of a ruptured tube due to tuberculosis in the absence of tubal pregnancy is rare. A case is reported of a young white woman giving a history and showing the clinical picture of ruptured tubal pregnancy. Laparotomy revealed only a bleeding fallopian tube due to the necrosis of a blood-vessel by the tuberculous process. No elements of gestation were found. The tubal tuberculosis was secondary to an apparently healed peritoneal process. The haemorrhage was not only free in the peritoneal cavity but had dissected the peritoneum over the bladder and broad ligament, giving rise to pain in the left lower portion of the abdomen, and tenderness over the bladder.—*Tuberculous Salpingitis Simulating Ruptured Tubal Pregnancy, K. A. Meyer and A. F. Lash, J. Am. M. Ass., February 2, 1929, xcii, 390.*—(*G. L. L.*)

Early Symptoms of Tuberculous Meningitis.—Early diagnosis is especially important in such a uniformly fatal disease as tuberculous meningitis. In this disease vomiting, sometimes of a psychic nature, and transient periods of irrationality help in causing one to suspect the diagnosis, especially if there is a history of tuberculosis in the family. Intermittent or continued fever without obvious explanation and trauma, especially of the head, are also

sometimes forerunners of the disease.—*Ein Frühsymptom der Meningitis tuberculosa, K. Ochsenins, Deutsche med. Wchnschr., February 8, 1929, lv, 224.*—(*H. S. W.*).

Tuberculoma of Brain.—In 1,699 consecutive postmortems at the New Haven Hospital, 809 including cranial contents, tuberculous meningitis was present 34 times, and, of these, gross involvement of brain substance was seen in 8 cases. Although the usual opinion is that tuberculoma is single and usually in the cerebellum, multiple involvement was seen in most of the 8 cases reported, and the cerebrum was one of the sites of location in seven of the eight. Recent articles report a majority of such lesions in adults, contrary to earlier opinion that tuberculomata were more frequently seen in children. Of the 8 cases reported, seven showed a definite reaction in the meninges, confirmed microscopically. This is in marked contrast to the less frequent association with tuberculous meningitis reported by some other writers.—*Eight Cases of Tuberculoma of Brain Found at Necropsy, H. W. Ferris, J. Am. M. Ass., May 18, 1929, xcii, 1670.*—(*G. L. L.*)

Pulmonary Tuberculosis and Tuberculosis of Skin.—It is usually assumed that patients with tuberculosis of the skin are exempt from pulmonary tuberculosis. It was shown, however, in two of the largest statistics (Leloir, Grouven) that approximately 30 per cent of all patients with lupus or scrofuloderma had clinically demonstrable signs of pulmonary tuberculosis. It is not sufficient to point out only the frequency of coincidence, but it is necessary to investigate the mutual influence of the two lesions. Forchhammer reported 1,190 patients seen at the Finsen Institute from 1896 to 1906, and found that 0.89 per cent of them died every year of pulmonary tuberculosis. At the same time the general tuberculosis mortality for Denmark was 0.127 per cent in average, that is, only one-seventh of the tuberculosis mortality of patients with lupus. While 10.5 per cent of all deaths were due to pulmonary tuberculosis in the general population, 45 per cent of all deaths among all patients with lupus was due to the same cause. Statistics from the dermatological clinic at Breslau showed that 21.5 per cent of all patients with cutaneous tuberculosis had pulmonary tuberculosis, and that 5 per cent of them had progressive pulmonary lesions. During four years (1925 to 1928) 111 patients with cutaneous tuberculosis were admitted to the dermatological clinic at the University at Freiburg. They were all examined roentgenologically. It was found that 12 to 19 per cent of these patients had pulmonary tuberculosis. This is approximately the same percentage as is found in patients with other types of extrapulmonary tuberculosis. The generally accepted dictum that skin tuberculosis renders a patient immune to pulmonary tuberculosis cannot be maintained; it must be emphasized that skin tuberculosis predisposes to pulmonary tuberculosis, and it appears that the latter usually develops later than the former.—*Über die Beziehungen der Lungentuberkulose zur Hauttuberkulose, Keller and Schilling, Klin. Wchnschr., March 26, 1929, xiii, 603.*—(*M.P.*)

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